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## ENERGY DEPARTMENT

### NOTIFICATION

The 3rd December 2014

**S. R. O. No. 578/2014**—in exercise of the powers conferred by sub-section (1) of Section 180 of the Electricity Act, 2003 (Central Act 36-of 2003), read with Regulation 29 (1) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation-2010 and in suppression of all previous notifications on the subject, the Governor of Odisha pleased to direct that the. grant of licenses, certificates of competency and permits to Electrical Contractors, Supervisors and Electrical workmen respectively shall with effect from the date .of issue of the order be governed in the.whole of the state.of Odisha by following regulations, namely :—

Electrical Licensing Board Regulation, Odisha, 2014

#### 1. TITLE AND COMMENCEMENT :

(a) These regulations may be called “Electrical Licensing Regulation of Odisha” for issue of :

(i) Licenses to Electrical Contractors

(ii) Certificates of Competency to Electrical Supervisors

(iii) Permits to Electrical Workman

(b) They shall come into force on the date of their final publication in the Official Gazette.

#### 2 DEFINITIONS :

In these regulations unless the context otherwise requires:-

(a) “The Board” means the Electrical Licensing Board, Odisha appointed under Regulation 3

(b) “Secretary” means Secretary to the Electrical Licensing Board, Odisha

(c) “The Chairman” means the Chairman of the Board

(d) “Member” means Member of the Board

- (e) "The Electrical Inspector" means the Electrical Inspector to the Government of Odisha
- (f) "Supervisor" means the Electrical Supervisor qualified under these Regulations
- (g) "Workman" means an Electrical Workman qualified under these Regulations
- (h) "Form" means a form appended to these Regulations
- (i) "Permit" means the permit granted under this regulation to workman
- (j) "SCC" means the supervisor certificate of competency granted under this regulation to supervisors.
- (k) "Learner Permit" means a permit issued to a person to work under direct guidance of a person having appropriate category of supervisory certificate of competency for the purpose of learning.
- (l) "MV" means the voltage class not exceeding 650 Volt
- (m) "HT" means the voltage class not exceeding 33 KV
- (n) "EHT" means the voltage class exceeding 33 KV
- (o) "Prescribed fees" the Govt. may notify the fee for issue /renewal etc for license SCC / Permit from time to time.
- (p) All other words and expressions used in this regulation and not defined shall have the meanings respectively assigned in the Electricity Act-2003 and Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation-2010.
3. (A) A board shall be constituted as Electrical License Board, Odisha (ELBO) to exercise such functions & perform such duties as assigned to it under this Regulation.
- (B) The Board shall be constituted by Govt. of Odisha consisting of following members namely:—
- |  |                        |
|--|------------------------|
| (1) E.I.C (Elec)-cum-PCEI (O), ( <i>Ex Officio</i> )   | . . . Chairman         |
| (2) Electrical Inspector (Hq.) & Secretary,<br>E.L.B.O. ( <i>Ex Officio</i> ).   | . . . Member-Secretary |
| (3) Chief Engineer (Testing, Calibration & Licensing) or<br>CEI (T&D), Odisha, Bhubaneswar ( <i>Ex Officio</i> ).                    | . . . Member           |
| (4) Joint Apprenticeship Advisor, Office of the Director of Technical<br>Education & Training, Odisha, Cuttack ( <i>Ex Officio</i> ) | . . . Member           |
| (5) C.G.M. (Construction), OPTCL, Bhubaneswar ( <i>Ex Officio</i> )  | . . . Member           |
| (6) Deputy Director of Mines, Safety (Ele.),<br>Govt. of India. S.E. Zone, Ranchi ; ( <i>Ex Officio</i> )                            | . . . Member           |

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|--|-----|--------|
| (7) A Representative of all Odisha Electrical Contractors Association (Having criteria mentioned below)                              | . . | Member |
| (8) A Representative of Distribution Licensee having Degree in Electrical Engg. & working not below the rank of General Manger (O&M) | . . | Member |
| (9) A Representative of Large Industrial Organizations (Having criteria mentioned below).  | . . | Member |

Criteria For :—

(a) Member from Electrical Contractor's Association :

- (i) Degree in Electrical Engineering or equivalent ; and
- (ii) Possession of HT Contractor License from Electrical License Board, Odisha for a minimum period of 15 years.

(b) Member from Large Industries of Odisha:-

- (i) Degree in Electrical Engineering ; and
- (ii) Twenty years electrical engineering working experience in Large Industries.

#### 4. TERMS OF OFFICE :

A member of the Board other than *Ex Officio* member of the Board shall hold office for a term of three years from the date of his appointment or such period as the State Government may direct.

#### 5. FILLING OF VACANCIES AND POWER TO FUNCTION NOT WITHSTANDING VACANCIES:

(a) Filling of vacancies of members:— If a Member of the Board other than an Ex-Officio member remain absent in consecutive three meetings or express an unwillingness to continue, another member may be appointed in his place for a term of three years or such period as Govt. may direct.

(b) The Board shall have power to act notwithstanding any vacancy in its Membership

#### 6. FUNCTION OF THE BOARD :

- (i) To grant and cancel of licenses to Electrical Contractors who satisfies the conditions stipulated in this regulation.
- (ii) To grant and cancel Certificates of Competency to Supervisors and permits to Electrical Workman who satisfies the conditions contemplated in this regulation and also ratify the SCC and Permits approved by Chairman provisionally in the exemption cases as per regulation No. 11(iv).
- (iii) To conduct examination for Supervisor and Electrical Workman

- (iv) To grant and cancel of temporary contractor license and contractor license who satisfies the condition stipulated in this regulation and also to ratify the provisional licenses approved by Chairman.
- (v) To advise the State Government regarding all matters related to issue of licenses, certificates or permits. In case of any changes / amendments required in the licensing procedure / criteria, Board may recommend the same to Govt. for consideration and incorporation in the license regulation through proper notification by Govt.
- (vi) To decide on the violation of any of the provision of these regulations on the part of Electrical Contractors. Permit holders and Supervisors as per Regulation Nos.32 & 33 based on the enquiry.

#### 7. MEETINGS OF THE BOARD:

The Board shall meet once in six months and at such other time as may be required in the opinion of the Chairman for transacting business, which can not be disposed of by circulation of papers. At least seven days prior notice of all meetings shall be sent to each Member.

#### 8 APPOINTMENT OF SUB-COMMITTEE :

The Board shall have power to appoint sub-committees or nominate a person and delegate such of its powers and function to these sub-committees or a person as the Board may consider appropriate.

#### 9. QUORUM:

Any five Members shall form the quorum at any meeting. It shall, however, be necessary for either the Chairman or the Secretary to be one of these five members present to enable the meeting to be held.

#### 10. CHAIRMAN OF THE MEETING :

The Chairman or in his absence, one of the members present in that meeting may be elected as the Chairman of the meeting and shall exercise his voting power in case of the equality of votes.

#### 11. FUNCTION OF THE CHAIRMAN:

- (i) To preside over all the meetings of the Board unless deprived of attending any meeting due to unavoidable circumstances.
- (ii) To approve the list of examiners to be appointed • for conducting the different examinations/ tests to be held under these regulations for grant of Supervisor Certificate of Competency and Workman Permit.
- (iii) To grant temporary contractor license / contractor license provisionally pending ratification by the Board.
- (iv) Endorsement of outside contractor license / supervisor license issued by other State Licensing Board pending ratification by the Board.

- (v) To grant the Supervisor Certificate of Competency and Workman Permit for exemption cases pending ratification by the board.
- (vi) To grant the contractor license in case of contractor applies to remain in lower class when he fails to maintain required qualifying Workman or Supervisor.
- (vii) To grant for renewal, of SCC after verification of Medical Certificate furnished by the Supervisors.
- (viii) To grant duplicate license, SCC & Permit
- (ix) Enquire or to arrange to enquire into violation of any of the provision of these rules on the part of Electrical Contractors, Supervisors & Workman Permit holders and to initiate appropriate action as decided by the Board.
- (x) To approve all expenditure relating to conduct of examination of Workman / Supervisors and related meetings.

## 12 (A) FUNCTION OF THE SECRETARY:

- (i) To take all actions as required and considered necessary in connection with Board's meetings, recording the proceedings of the meetings and all correspondences in accordance with the decisions of the Board.
- (ii) To notify the dates of examinations, scrutinize applications received, fix up programme for the examinations at various centers and take all such actions as is considered necessary for holding the examinations and processing the results.
- (iii) To scrutinize all exemption cases claimed from appearing in the examinations and put up to the Board for their consideration.
- (iv) To scrutinize all applications received for grant of electrical contractors licenses and put up to the board for their consideration.
- (v) To issue licenses / certificates of competency / permits on the basis of the decisions of the Licensing Board and make all correspondences as is necessary in this connection.
- (vi) To renew licenses / certificates of competency / Workman Permits as required
- (vii) To issue duplicate licenses / certificates of competency, Workman Permits as required.
- (viii) To take action as required in connection with complaints and allegations made against, holder of licenses / certificates of competency / Workman Permits as per licensing regulation.
- (ix) To maintain the registers of contractors/supervisors and workman to whom licenses, certificates of competency and permits have been issued by the Board.
- (x) To issue of Supervisor Certificate of Competency and Workman Permit on exemption basis after grant by Chairman.
- (xi) To conduct the EHT Workman Permit examination
- (xii) To do all other things directed by the Chairman or the Board

## (B) DELEGATION OF FUNCTION OF SECRETARY :

On behalf of the ELBO the Electrical Inspector of concerned Zone shall discharge the following functions in their respective jurisdictions:

- (i) To scrutinize all the applications received for issue of Workman Permits/ Renewal of Workman Permits upto HT work.
- (ii) To conduct the examination after it is notified centrally by the Secretary fixing the programme for the examination at various centers and to take all such actions as considered necessary for holding the examination and submit the results to the Secretary for obtaining approval of Electrical Licensing Board.
- (iii) To issue new permits on the basis of the approval of the Electrical Licensing Board, Odisha and make all correspondences as necessary in this connection.
- (iv) To renew Workman Permits of candidates in their respective jurisdiction.
- (v) To issue duplicate Workman Permit as and when required.
- (vi) To take action as required in connection with complaints and allegation made against the holders of Workman Permit as per this Regulation.
- (vii) To maintain register of Workman to whom permits have been issued by the Board.

(C) Notwithstanding anything contained in Regulation— 12 (B), Secretary as and when required may delegate or withdraw any functions with the approval of the Chairman.

## 13. EXAMINATION:

- (i) The Examinations shall be held at least once a year for grant of (a) Supervisor Certificate of Competency (b) Permits to Electrical Workmen. The periodicity of holding these examinations shall be decided by the Board from time to time.
- (ii) Examinations under these regulations shall be held at such places and on such dates as may be notified by the Secretary from time to time in the Odisha Gazette and local news papers.
- (iii) Every examination shall be of such a nature as to test the practical knowledge of the candidates to ascertain their competency and the adequacy of their practical experience to the satisfaction of the Board.
- (iv) Every examination shall be conducted at a place where the candidate's knowledge can be practically examined.
- (v) Examiners:
  - (a) The Secretary with the approval of the Chairman shall appoint local examiners for the purpose of conducting examinations at different centers. A representative of the Directorate of Mines, Government of India shall be included in the list of Examiners for issuing Certificate of Competency in respect of installations in Mines.

(b) The examiners so appointed shall receive such honorarium as approved by the Government from time to time.

(vi) On notification for examination, interested candidates for applying the Supervisor .Certificate of Competency and Workman Permit examination shall make an application in the prescribed format to Secretary, ELBO / Electrical Inspector of concerned Zone within the dates notified for the receipt together with,

(a) Conduct Certificate (From a Gazetted Officer)

(b) Practical Experience as required in different category with self-attestation.

(c) Xerox copy of Educational & Technical qualifications with self-attestation.

(d) Xerox copy of proof of date of birth with self attestation.

(e) Xerox copy of Identity proof such as Voter ID card / PAN card / Driving licenses / Aadhar card / Passport with self-attestation.

(f) Xerox copy of address proof such as Telephone Bill / Electricity Bill / Bank Pass Book / Gas Card / any other proof in support of address with self attestation.

(g) 3 (three) nos. of recent passport size colour photograph with white background.

(h) 3 (three) nos. specimen signature.

(i) Original treasury chalan in support of payment of the fees (non-refundable) for the examination.

**14. WORKMAN PERMIT EXAMINATION SHALL BE CONDUCTED FOR ISSUING WORKMAN PERMIT INTENDED TO WORK FOR THE FOLLOWING CATEGORIES :**

CATEGORY	PERMITTED TO WORK
(i) Electrical Workman-MV :	
(a) Wireman-MV (with Learner permit for Lineman-MV).	Domestic & Industrial Installations with Under Ground installation including equipment up to 650V.
(b) Lineman-MV (with Learner permit for Workman-HT)	Overhead & Underground installation including equipment up to 650V.
(ii) Electrical Workman-HT (with Learner permit for Workman-EHT)	Overhead / Underground installations & equipments up to 33KV including Under-ground.
(iii) Electrical Workman-EHT	All overhead and Underground electrical installations work and also installation of electrical equipment of all voltage class.
(iv) Endorsement for Cable jointing	11 KV or 33 KV. (For this purpose, a practical test in cable jointing work will be necessary).
(v) Endorsement for Mining for each category.	For this purpose it will be necessary to test the candidate's knowledge of the safety rules for working in mines.

All these examinations shall be conducted through *viva-voce* and the syllabus shall be as per Annexure-I. The syllabus may be amended from time to time as may be considered necessary by the Board.

A candidate must secure a minimum of 20 marks in the practical and oral test out of 50 marks for being declared to have passed the examination for issue of permits.

15. QUALIFICATION FOR WORKMAN PERMIT EXAMINATION :

(A) candidates for the examination of “WIREMAN-MV PERMIT” (with learner permit for lineman-MV) shall be a person,—

- (i) Who has passed minimum Class-VII and has been trained in electrical works at least two years under a person possessing a valid Supervisor Certificate of Competency granted by the Board. The experience certificate should be signed by the Licensed Contractor and Supervisor (MV/HT/EHT) describing the nature of work.

Persons working in industry, registered under Factory Act, 1948 and having connected load more than 250 KW shall obtain experience certificate from Supervisor having valid SCC of Government of Odisha duly countersigned by the employer.

- (ii) Who has worked for at least for two years as helper assisting the workman (Wireman) under the Supervision of an electrical engineer of Odisha Government, Odisha Government undertaking and Distribution Licensees. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Executive Engineer / Manager) describing the nature of work (this provision is extended for one year only from the date of notification of this regulation).
- (iii) Who has successfully passed the course prescribed for Electrical Wireman Trade/ Electrician Trade from a recognized Industrial Training Institute of the State or any equivalent examination (approved by NCVT) is exempted for examination.

(B) Candidate for the examination of “LINEMAN-MV PERMIT” (with learner permit for Workman-HT) shall be a person:

- (i) Having learner Lineman-MV permit and has been trained in MV works at least for two (02) years under a person possessing a valid Supervisor Certificate of Competency granted by the Board. The experience certificate should be signed by the Licensed Contractor and Supervisor (MV/HT/EHT) describing the nature of work.

Persons working in industry, registered under Factory Act, 1948 and having connected load more than 250 KW shall obtain experience certificate from Supervisor having valid SCC of Government of Odisha duly countersigned by the employer.

- (ii) Who has worked for at least for three (03) years as helper assisting the lineman under the supervision of an electrical engineer of Odisha Government, Odisha Government undertaking and Distribution Licensees. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Executive Engineer / Manager) describing the nature of work (this provision is extended for one year only from the date of notification of this regulation).



- (iii) Who has successfully passed ITI course prescribed for Electrician trade from a recognized Industrial Training Institute of the State or any equivalent examination (approved by NCVT) is exempted from appearing examination.
  - (iv) Who has successfully passed ITI Wireman trade from a recognized Industrial Training Institute of the State or any equivalent examination (approved by NCVT) having two year apprentices training as Lineman is exempted from appearing examination.
- (C) Candidate for the examination of “WORKMAN-HT PERMIT” (with Learner permit for Workman-EHT) shall be a person,—
- (i) Having Learner Workman-HT permit and has been trained in HT works at least for two years under a person possessing a valid Supervisor Certificate of Competency granted by the Board. The experience certificate should be signed by the Licensed Contractor and Supervisor (HT/EHT) describing the nature of work.
- Persons working in industry, registered under Factory Act, 1948 and having connected load more than 250 KW shall obtain experience certificate from Supervisor having valid SCC of Government of Odisha duly countersigned by the employer.
- (ii) Having, learner Workman-HT permit and worked for at least two years HT works assisting the lineman under the supervision of an electrical engineer of Odisha Government, Odisha Government undertaking and Distribution Licensees. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Executive Engineer / Manager) describing the nature of Work.
  - (iii) Having ITI Electricians Trade employed by OPTCL and successfully completed one year training under OPTCL training centre are exempted from appearing examination on completion of one year experience after training. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Executive Engineer / Manager). describing the nature of work which should be countersigned by CGM (O&M), OPTCL. The xerox copy of the training certificate is mandatory.
- (D) Candidate for the examination for “WORKMAN-EHT PERMIT” shall be a person:—
- (i) With ITI Electrician trade having learner Workman-EHT permit and has assisted in EHT works at least for three years under a person possessing a valid Supervisor Certificate of Competency granted by the Board.. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Executive Engineer / Manager) describing the nature of. work. In case of persons working under the contractor the experience certificate shall be obtained describing the nature of work and signed by the contractor & EHT supervisor.

- (ii) Having learner Workman-EHT permit and employed by OPTCL successfully completed one year training under OPTCL training centre and has been trained in EHT works at least for five years after training, under a person possessing a valid Supervisor Certificate of Competency granted by the Board. The experience certificate describing the nature of work shall be obtained from higher technical authority not below the rank of Executive engineer / Manager describing the nature of work and recommended by OPTCL higher authority (not below the rank of General Manager).
- (iii) With ITI Electricians trade employed by OPTCL having learner Workman-EHT permit successfully completed two years experience. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Executive Engineer / Manager) describing the nature of work which should be countersigned by CGM (O&M), OPTCL.

#### 16. MINIMUM AGE FOR OBTAINING PERMIT :

A candidate for the examination for Workman Permit shall be a person not below the age of 20 (twenty) years on the date of application to appear in the examination.

#### 17. GRANT OF WORKMAN PERMIT :

- (i) Workman permit in Form-“F” shall be granted by the board to every successful candidate who passed the examination for electrical Workman Permit.
- (ii) The board may also grant to any person who qualifies as per the regulation -15(A)(iii), 15(B)(iii) & (iv) and 15(C)(iii).
- (iii) ELBO shall also recognize the workman permit issued by other States Licensing Board under regulation 29 (1) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation - 2010 with which Government of Odisha have reciprocal arrangements and issue equivalent appropriate category of permit after verification.

#### 18. CONVERSION OF PERMIT :

Since the existing 6 categories of workman permits has been restructured into four categories only, the existing permit holder of different categories will be brought over to new permit categories as mentioned below :

Existing Categories	Converted Categories
(i) Wireman - C	Wireman-MV (with Learner Permit for Lineman-MV)
(ii) Wireman - B	
(i) Wireman - A	Lineman-MV (with Learner Permit for Workman-HT)
(ii) Lineman - C	
(i) Lineman - B	Workman-HT (with Learner Permit for Workman-EHT)
(ii) Lineman-A	

After conversion of new categories brought into effect, the experiences thereafter will be considered for further upgradation and, endorsement.

## 19. EXAMINATION FOR SUPERVISOR CERTIFICATE OF COMPETENCY :

The examination for Supervisor Certificate of Competency is intended for a person who directly supervises Electrical Installation work.

- (a) The examination for Supervisor Certificate of Competency shall be comprised of written paper and oral test for MV & HT. The examination question papers shall be set in English and the candidates are required to answer in English normally. However the Board may permit a candidate to answer in Odia. The *Viva-Voce* test can be taken either in English / Odia / Hindi for the convenience of the candidate.

It is also necessary for candidates to be well conversant with the I.E. Rules / Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010 for the installations in addition to knowledge on technical standards and specification.

- (b) The syllabus for the written and oral test shall be the common syllabus as per Annexures -II, III & IV. The syllabus may be added to or amended from time to time as may be considered, by the Board or CEA guidelines.
- (c) A candidate must secure a minimum 50 marks out of 100 in written paper to appear for practical and oral tests. Minimum 50 marks out of 100 is again to be secured in oral tests for being declared to have passed the examination for issue of certificate of competency in case of MV & HT. ,

## 20. QUALIFICATION FOR SCC EXAMINATIONS :

### (A) For Supervisor Certificate of Competency (SCC-MV)

Candidates for examination of Supervisor Certificate of Competency (General or Mining) must comply with Regulation-13(vi) of this regulation and must have passed Degree in Electrical Engineering or Diploma in Electrical engineering having 02 (two) years working experience or Electrician Trade from an ITI with 05 (five) years experience or +2 Science having valid Workman Permit with 06 (six) years experience in electrical installation work (The candidates having +2 Science qualification will be allowed for one year from the date of issue of Regulation). For this purpose a certificate of experience describing the nature of work is to be furnished from a SCC (MV) holder and to be countersigned by the contractor. In the case of a person working under industry the certificate is to be countersigned by the employer.

### (B) For Supervisor Certificate of Competency (SCC-HTI)

Candidates for examination of SCC (HT) must have in possession of SCC (MV) with knowledge and experience (of at least two years for Degree Electrical Engineers and three years for Diploma Electrical Engineers) about HT installations towards inspections, design, testing and commissioning, construction, operation and maintenance. For this purpose a certificate of experience about his knowledge is to be furnished from a SCC (HT / EHT) holder. In the case of a person working under industry the certificate is to be countersigned by the employer.

## 21. MINIMUM AGE FOR OBTAINING, SUPERVISOR CERTIFICATE OF COMPETENCY (SCC) :

A candidate for the examination / exemption for Supervisor Certificate of Competency shall be a person not below the age of 23 (twenty three) years on the date of application.

## 22. GRANT OF SUPERVISOR CERTIFICATE OF COMPETENCY (MV) :

(i) Supervisor Certificate of Competency, (SCC-MV) in Form-"C" shall be granted by the Board to a candidate on receipt of application in prescribed format with a chalan in support of payment of the prescribed fees (non-refundable) subject to—

(a) Who has passed the examination for Supervisor Certificate of Competency held by the (Electrical Licensing) Board in accordance with Regulation-19.

(b) Who has obtained a similar certificate of competency from any other electrical licensing Board who have adopted the common syllabus and with whom the State Government have reciprocal arrangements in this respect.

(ii) The Board may also grant SCC (MV) to a person on exemption from appearing examination—

Who has obtained a Diploma or Degree in Electrical Engineering from any Engineering School, College or Institution recognized by the State Government and who has working experience for at least three years in case of Diploma holder and two years in case of Degree holder either in Government of Odisha / in any fully owned Government of Odisha Undertaking / OHPC / OPTCL / GRIDCO / OPGC and Distribution Licensees, Central Government, Central Public Sector Undertaking (CPSU) and Private Industries registered under Factory Act, 1948 in the State of Odisha. The experience certificate shall be obtained from the higher Technical Authority (not below the rank of Superintending Engineer / General Manager) describing the nature of work. This SCC (MV) granted under this regulation however can be utilized only for the organization he is serving during his period of service and can not supervise and give certificate for such supervision for any other work not belonging to his respective employment.

## 23. GRANT OF SUPERVISOR CERTIFICATE OF COMPETENCY (HT) :

(i) Supervisor Certificate of Competency shall be endorsed in Form-'C' to a candidate on receipt of application in prescribed format with a chalan in support of payment of the prescribed fees (non-refundable) subject to—

(a) Who has passed the examination for SCC (HT) in accordance to Regulation-19.

(b) Who has obtained a similar certificate of competency from any other electrical licensing Board who have adopted the common syllabus and with whom the State Government have reciprocal arrangements in this respect.

- (ii) The Board may also grant SCC (HT) to a person on exemption from appearing examination—

Who has obtained a Diploma/Degree in Electrical Engineering & directly working under Government of Odisha / OHPC / OPGC / OPTCL / GRIDCO / Central Government in any fully owned Government of Odisha undertaking / Distribution Licensee / Central Public Sector Undertaking / Private Industries registered under Factory Act, 1948 operating in the State of Odisha having, at, least 10 (Ten) years in service out of which 5 (Five) years for Degree Engineers and 7 (Seven) years for Diploma Engineers spent in the field of construction/ Repair / Maintenance / Testing / Inspection / Commissioning of HT works. The experience certificate shall be obtained from the Higher Technical Authority (not below the rank of Superintending Engineer / General Manager) describing the nature of work. The SCC (HT) granted under this regulation, however can be utilized only for the organization he is serving during his period of service and cannot supervise and give certificate for such supervision for any other work not belonging to his respective employment.

#### 24. GRANT OF SUPERVISOR CERTIFICATE OF COMPETENCY (EHT) :

Supervisor Certificate of Competency shall be endorsed in Form- C to a candidate on receipt of application in prescribed format subject to—

- (a) Who has obtained a Degree in Electrical Engineering or equivalent and in possession of SCC (HT) with knowledge and experience of at least 7 (seven) years in EHT installations on design, testing, commissioning, construction, inspection, operation and maintenance. For this purpose a certificate of experience about his knowledge is to be furnished from the higher technical authority (not below the rank of Superintending Engineer / General Manager) describing the nature of work in case if employed in Government of Odisha / OPTCL / OHPC / OPGC / Central Government & Central Public Sector undertakings / Large Industries' Operating in Odisha registered under Factory Act, 1948 utilizing power supply above 33 KV. In case of private industries Operating in Odisha registered under Factory Act-1948 the experience certificate should be countersigned by the employer.

#### 25. GRANT OF ELECTRICAL CONTRACTOR'S LICENSE :

An Electrical Contractor License shall be granted in Form-'D' only to a person (or a Firm approved by the Board, who satisfies the conditions laid down below :—

- (a) The applicant must be a citizen of India
- (b) The applicant must have attained the age of 18 (Eighteen) years as on the date of application and has passed 10th (Tenth) standard examination.
- (c) If the license is sought for a partnership firm, the firm must have submitted partnership deed or if the License is sought for a registered company, the same must have been registered with the Registrar of Companies. In case of a partnership firm all the partners of the firm and in case of a registered company not less TWO THIRD of total number

of Directors may resolve and issue an authorization letter to the authorized signatory to sign the application on behalf of the firm or company as the case may be. The authorization letter shall be on Rs.100/-stamp paper.

- (d) The applicant shall not be an employee of a State or Central Government or Public Sector undertaking.
- (e) Where an applicant either as proprietor or partner of a firm or Director of a company is found to have been penalized as per the provision of Regulation 33, he shall not be eligible for grant of another license either as a proprietor or as a partner or as a Director as the case may be.

## 26. ISSUE OF LICENSE TO ELECTRICAL CONTRACTORS :

An application for a contractor license shall be made to the Secretary, E.L.B.O, Bhubaneswar in prescribed format with a chalan in support of payment of the prescribed fees (non-refundable).

Every Application form for Contractor License shall be accompanied by the followings :—

- (a) Original Treasury Challan for having remitted the requisite fee
- (b) Specimen signature and three recent passport size colour photographs with white background showing the complete face of the applicant. The photograph shall be self attested at the backside.
- (c) Photocopy of PAN card with self attestation
- (d) Any of the photo identity proof of the applicant such as Passport, Voter Identity Card, Driving License, PAN Card & Aadhar Card with self attestation.
- (e) Proof of address of business such as Telephone Bill / Electricity Bill / Bank Passbook with self attestation or an affidavit sworn before the Notary.
- (f) If the license is sought for a partnership firm, a copy of registered partnership deed and if the license is sought for a registered company, copy of Memorandum and Articles of Association approved by the Registrar of Companies and authorization letter in original, issued to the authorized signatory by the partnership firm or company as the case maybe.
- (g) Copies of the appointment letter of Supervisors & Workman signed by the contractor with date.
- (h) Willingness letter obtained from Supervisor, Workman with their full signature with date along with the original Permit and SCC.
- (i) Affidavit from the Workman & Supervisor indicating they are the sole employment, of the contractor to be furnished individually.
- (j) Affidavit from the contractor indicating the name of workman / supervisor with their permit and license number indicating all the workman & supervisors are working under his establishment.

- (k) Proof of execution of work done including adherence to the quality in case of EHT contractor as stipulated as the provision in this regulation.
- (l) Copies of educational qualification along with proof of age with self attestation.
- (m) Undertaking regarding possession of the instruments and T&P as per regulation.
- (n) Undertaking to engage at least 50% full time Workman possessing appropriate permits issued by ELBO.
- (o) Verification .certificate of Workman & Supervisor under his sole employment.

26. (A) Issue of MV Contractor License :

- (a) He shall either himself hold a Supervisor Certificate of Competency and personally execute and supervise all works undertaken by him or have at least one whole-time supervisor holding a Supervisor Certificate of Competency (MV) in his employment for the supervision of works undertaken by him.
- (b) Should have in his full time employment of minimum—
  - (i) 1 (one) Wireman MV.
  - (ii) 1 (one) Lineman MV.
- (c) He should submit an undertaking to engage at least 50% full time workman possessing appropriate permits issued by ELBO for the execution of works undertaken by him.
- (d) He shall always maintain the following testing instruments in good working condition, duly calibrated for carrying out the tests required under the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010 and shall present them whenever required to do so for checking and inspection by any officer of the Electrical Inspectorate of Government of Odisha.
  - One Insulation Tester-500 volt class.
  - One Earth Tester with accessories
  - Tongue tester.
  - Hand drilling machine.
  - Multi-meter
  - Phase sequence indicator
  - Hand Rubber Gloves tested as per ISS-4770 (not to be used beyond three years of manufacture).

He should submit an undertaking regarding possession of. the above instruments and T&P during application and renewal.

- (e) He should maintain appropriate establishment to conduct his business and furnish an undertaking to that effect.

## 26. (B) Issue of HT Contractor License :

## (i) The applicant—

(a) He shall either himself hold a HT Supervisor Certificate of Competency and personally execute and supervise all works undertaken by him or have at least one whole-time supervisor holding a Supervisor Certificate of Competency (HT) in his employment for the supervision of works undertaken by him.

## (b) Should have in his full time employment of minimum—

(i) 1 (one) Workman HT.

(ii) 1 (one) Lineman MV.

(iii) 1 (one) Wireman MV.

(c) He should submit an undertaking to engage at least 50% full time workman possessing appropriate permits issued by ELBO for the execution of works undertaken by him.

(d) He shall always maintain the following testing instruments in good working condition duly calibrated for carrying out the tests required under the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010 and shall present them whenever required to do so for checking and inspection by any officer of the Electrical Inspectorate of Government of Odisha.

- One Insulation Tester - 500V & 1000V / 2.5KV / 5KV Class
- Live Line Tester (One for each Workman)
- Multi-meter
- Phase sequence indicator
- Tongue tester
- Hand drilling machine
- One Earth Tester with accessories
- Lead Lift with different type pulley
- Hand operated and hydraulic crimping tool
- Pedestal drilling machine
- Tree cutting power saw
- Discharge Rod
- Hand Rubber gloves tested as per ISS-4770 (not to be used beyond three years of manufacture).

He should submit an undertaking regarding possession of the above instruments and T&P during application and renewal.

(e) He should maintain appropriate establishment to conduct his business and furnish an undertaking to that effect.



(C) Issue of HT Contractor License endorsement with cable jointing :

In the event where H.T. Contractor desires to take up H.T. Cable laying/jointing works, he shall have in full time employment a workman with endorsement for H.T. cable jointing and shall have his H.T. License endorsed for H.T. cable jointing indicating the voltage upto which the cable jointing is endorsed (i.e. up to 11KV or 33KV).

(D) Issue of EHT Contractor License :

(i) The applicant—

(a) Shall have a valid H.T. contractor license for a minimum continuous period of three years and must have executed the installation and commissioning work of not less than 5 (five) number of H.T. electrical installation works or EHT work having temporary project license in last three years. Proof of such execution of works including adherence to the quality shall be furnished to the satisfaction of the Board.

(b) He shall either himself hold a Supervisor Certificate of Competency (E.H.T) & personally execute and supervise all works undertaken by him or have at least one whole-time supervisor holding a Supervisor Certificate of Competency (E.H.T) in his employment for direct supervision of works undertaken by him.

(c) Should have in his full time employment of minimum—

(i) 2 (two) Workman E.H.T.

(ii) 2 (two) Workman HT.

(iii) 1 (one) Wireman MV.

(d) He should submit an undertaking to engage at least 50% full-time workman possessing appropriate permits issued by ELBO for the execution of works undertaken by him.

(e) He shall always maintain at least the following testing instruments and equipments in good working condition duly calibrated for carrying out the tests required under the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010 and shall present them whenever required to do so for checking and inspection by any officer of the Electrical Inspectorate of Government of Odisha.

- One 5KV Motorized Insulation Tester
- One 1000V Insulation Tester
- One Earth Tester with Accessories
- Tong Tester
- Two Digital Multi-meters
- Two Hydraulic Compressor / Motorized Compressor
- Four sets Lead Lift with different types of Pulley
- Theodolite.

- Rubber Hand Glove tested as per ISS-4770 (not to be used beyond three years of manufacture)
- Safety Belt
- Hand operated and hydraulic crimping tool
- Single phase welding generator
- Gas cutting set
- Pedestal Drilling machine
- Vibrator
- Camalong clamp for different conductor and earth wire
- Discharge Rod

He should submit an undertaking regarding possession of the above instruments and T&P during application and renewal.

- (f) He should maintain appropriate establishment to conduct his business and furnish an undertaking to that effect.

## 27 (A) ISSUE OF TEMPORARY CONTRACTOR LICENSE FOR A SPECIFIC PURPOSE

Subject to fulfillment of the conditions as laid down in Regulation 26 a temporary contractor license is issued for specific project, specific period and for specific purpose to a person/firm not possessing requisite contractor license issued by ELBO to take up the project.

An application in the prescribed format alongwith a copy of the work order and chalan for the prescribed fee (non-refundable) may be made to the Secretary, ELBO.

If the Chairman is satisfied about the need, the temporary contractor license shall be granted provisionally pending ratification by Board. The conditions based on which permanent licenses are issued for the various categories of work as laid down in Regulations 25 & 26 of this regulation are met for corresponding types of work for which temporary license is required. Such a license shall be issued for a period of one year or the completion time as mentioned in the work order whichever is earlier. This may be extended to a maximum period of five years or the contract period which ever is lower with required fees.

For issue of temporary contractor license verifications of workman & supervisor are required.

On receipt of application if there is no objection / correspondence regarding defects then after one month from the date of receipt it is will be presumed that documents are correct and license is to be issued.

**27 (B) ENDORSEMENT OF OUTSIDE CONTRACTOR LICENSE ISSUED BY OTHER STATE LICENSING BOARD.**

The contractor having Electrical Contractor license issued by licensing board of other States will be allowed to take up the work in the State of Odisha through endorsement subject to fulfillment of following conditions :—

- (i) Needs verification of authenticity of license of the Contractor, Workman Permit of workman and Supervisor Certificate Competency of supervisor working under the contractor for which—
  - (a) He should submit one self declaration regarding the authenticity of license / SCC / permit issued by other State.
  - (b) The affidavit to the correctness of all the documents submitted are to be furnished.
  - (c) The experience certificate / qualification of the supervisor & permit holder are to be submitted by the contractor and the persons are to be personally verified along with their license book issued by other State by ELBO.
  - (d) Adjustment of appropriate category of workman according to this regulation verifying their experience is to be approved by the Chairman for the workman permits issued by other States.
- (ii) The Contractor is to abide to all other stipulation laid down in this regulation.

**27 (C) ENDORSEMENT OF OUTSIDE SUPERVISOR CERTIFICATE OF COMPETENCY (SCC) ISSUED BY OTHER STATE LICENSING BOARD :**

The supervisor having SCC issued by licensing board of other States will be allowed to take up the work in the State of Odisha through endorsement subject to fulfillment of following conditions :—

- (i) Needs verification of authenticity of SCC issued by other licensing board for which—
  - (a) He should submit one self declaration regarding the authenticity of SCC issued by other State.
  - (b) The affidavit to the correctness of all the documents submitted are to be furnished
  - (c) The experience certificate / qualification of the supervisor is to be submitted and the persons is to be personally verified along with their license book issued by other State by ELBO.
- (ii) The Supervisor is to abide to all other stipulation laid down in this regulation.

## 28. VALIDITY AND RENEWALS OF PERMITS, CERTIFICATES OF COMPETENCY AND ELECTRICAL CONTRACTOR'S LICENSES :

- (i) The permits granted under these regulations shall be valid for a period of five years and shall be renewed periodically not exceeding 5 (Five) years at a time till attaining the age of 62 years on payment of non-refundable renewal fees as prescribed.
- (ii) Supervisor Competency Certificate granted under these regulations shall be valid for a period of 3 (three) years and shall be renewed periodically not exceeding 3 (three) years at a time till attaining the age of 60 (sixty) years on payment of non-refundable renewal fees as prescribed :—

Provided that grant or renewal of Supervisor Certificate of Competency to the applicant / Certificate holder after attaining the age of sixty years shall be issued for a period not exceeding 3 (three) years up to 70 years on production of physical fitness from a Govt. Medical Officer not below the rank of District Medical Officer / Chief District Medical Officer.

- (iii) The contractor license granted under these regulation shall be valid for a period of 3 (three) years and shall be renewed periodically not exceeding 3 (three) years on payment of non-refundable renewal fees as prescribed and submission of continuation certificate by the staff with counter signature of the contractor. If there is any need for verification the contractor may be directed to verify all the staffs.
- (iv) The application for renewal in the prescribed format together with the permit, certificate of competency / contractor's license and the challans in support of the prescribed fees shall be submitted, 01 clear month before the expiry but not before 03 clear months :

Provided further that late renewal for permit, SCC and Contractor License may also be granted within a period of 12 (twelve) months from the date of expiry with prescribed penalty and invalidating the late period.

If the SCC & Permits are required to be issued after expiry of all grace period, then the SCC / Permit holder has to apply afresh for new SCC / Permit of their same category and it will be issued on qualifying in the examination.

If the contractor license is required to be issued after expiry of all the grace period [ i.e. 12 (twelve) months from the date of expiry] the contractor has to apply afresh for new license.

## 29. ISSUE OF DUPLICATE COPY OF PERMIT / CERTIFICATE OR LICENSE :

On being satisfied that an original Permit / Certificate or License granted under these regulations has been lost or destroyed, on application in the prescribed format the Secretary may grant a duplicate permit / certificate or license on payment of the fee prescribed for each

category after submission of FIR copy along with an affidavit as per Annexure -V in case of lost and an affidavit from a Notary in case of destroyed, three specimen signature and three recent passport size colour photographs.

In case lost or destroyed, duplicate permit / certificate or license will be issued if applied latest before completion of one year of expiry.

30. MAINTENANCE OF RECORDS : Separate registers shall be maintained for Workman Permits, Certificates of Competency, Contractors' License including temporary contractor license in which the dates of issue, renewals, endorsements and any other attributes shall be duly recorded.

31. OBLIGATION OF LICENSED CONTRACTORS, SUPERVISORS AND ELECTRICAL WORKMAN

(A) LICENSED CONTRACTORS :—

(i) As per provision of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010, no electrical installation works undertaken by the holder of a valid contractor license shall be carried out without the direct supervision of a person possessing a certificate of competency and at least fifty per cent (50%) of the Electrical Workmen employed in any such work in possession of a valid permit. Both the supervisor and the workman should work full time for him.

After completion of such electrical installation work, a test / completion report shall be furnished by the contractor to the supplier/consumer/owner or occupier. The report shall be signed by the Supervisor under whose supervision the work has been carried out and countersigned by the holder of the contractor's license who shall be wholly responsible for the proper execution of the work (Signature of the Supervisor & Contractor should tally with the specimen signature given by them during issue of Licenses / Certificates from ELBO.)

(ii) Every licensed contractor shall maintain a register of all supervisors and workman employed by him. Proper record of the names of the supervisor and workman engaged in each work shall be maintained to ascertain designated persons.

Such register maintained under above obligation shall be produced before the Electrical Inspector or any person authorized by him on his behalf when required and if on inspection Electrical Inspector finds that the designated person(s) does/do not fulfill the required qualification, he shall recommended the removal of the name of such persons from the register under intimation to the ELBO.

(iii) A quarterly return giving the details of works executed during a quarter, the supervisor and the electrical workman engaged in each work and such other information incidental to it shall be furnished to the Secy., ELBO in such form and within such time as may be prescribed for this purpose.

Return shall be filed Online in the ELBO website within 15th day of the following month of each quarter (i.e. by 15th July, 15th October 15th Jan. and 15th April) failing to file return for 03 (three) consecutive quarter will be considered to be deemed cancelled of the license. Any suppression of facts of the work undertaken will be considered as violation of ELBO Regulation.

- (iv) The holder of a contractor's license shall be either in possession of a valid supervisor certificate of competency or retain on his sole employment at least one supervisor holding a valid supervisor certificate of competency and the minimum number of Workman of different categories specified under Regulation, 26, failing which the license shall be invalid. If within 3 (three) months of the license becoming so invalid and the license is not revalidated after fulfilling the required conditions, the license shall be deemed to have been cancelled.
- (v) License contractor may apply to endorse his license to a lower class of license when he fails to maintain the required qualifying workman and supervisor.
- (vi) The contractor shall maintain a register of the Workman / Supervisors engaged for each of the work undertaken by him. It should contain the Name, Address with Mobile number & Signature of the Workman / Supervisors along with date of work undertaken by them. The register should be produced at any time on demand by Secretary, ELBO or any Electrical Inspectors for verification.
- (vii) The contractor shall have obligation to give 3 months prior notice to the Supervisor / Workman for terminating the contract of employment under intimation to E.L.B.O, Odisha, BBSR.
- (viii) If the holder of the license accepted an employment under any other firm or person shall surrender the license to the Secy., ELBO for cancellation.
- (ix) The holder of the license shall have in his possession the instruments and T&P specified in Regulation, 26 for carrying out the different types of work undertaken by him.
- (x) The holder of the license shall intimate the Secretary in writing within the period specified below as to every change of the following for updating the data. Failing to adhere to the above instruction shall lead to cancellation of contractor license.
  - Address of the place of business within seven days of such change
  - Proprietorship within seven days of such change, (in case of death within one month)
  - Authorized representative or dissolution of partnership within seven days (in case of death within one month).
  - Mobile number within 7 (seven) days of such change

- (xii) At the time of disaster like situation (like Cyclone / Flood, etc.) the contractors have to discharge obligation for restoration of electricity supply. As & when Govt. directs, the contractors shall mobilize their manpower / machheries and other resources to undertake restoration work immediately.

**(B) SUPERVISOR :**

- (i) Every person who holds a valid supervisor certificate of competency shall remain in the sole employment of one licensed contractor at any time and he shall report any change in employment within a week of such change to the .Secretary.
- (ii) Persons who have been exempted from appearing in the examination and granted a certificate of competency by virtue of their departmental status shall be treated as supervisors only for the specific purpose. They shall not give certificate for supervision of any other installation work not covere under the scope of respective employment.
- (iii) The Supervisor shall have obligation to give 3 (three) months prior notice to the contractor for resigning from the employment under intimation to the E.L.B.O., Odisha, BBSR.

Further he cannot rejoin in employment of same contractor in the next 6 (six) months.

- (iv) The Supervisor should be present at the time of inspection by the Electrical Inspector if asked for.
- (v) The holder of the SCC shall intimate the Secretary in writing within the period specified below as to every change of the following for updating the data. Failing to adhere to the above instruction shall lead to cancellation of Supervisor Certificate of Competency.
  - Present address of the Supervisor within seven days of such change
  - Mobile number within seven days of such change

**(C) WORKMAN :**

- (i) Persons holding valid workman permit in sole employment of any employer shall not work in installation not covered under the scope of his employment. Any change in employment shall be reported to the Secretary within a week.
- (ii) The person having valid Workman Permit shall have obligation to give 3 (three) months prior notice to the contractor for resigning from the employment under intimation to the ELBO, Bhubaneswar.

Further he cannot rejoin in employment of same contractor in the next 6 (six) months.

**32. UNAUTHORIZED ENTRIES, MUTILATIONS OR DEFACEMENTS OF THE LICENSE / CERTIFICATE / PERMITS :**

Any mutilation or defacement or any unauthorized entry in any license / certificate / permit shall make the license / certificate / permit liable for cancellation by the Secretary. The decision of the Board in this respect shall be final if appeal is made within 30 (thirty)

days of such cancellation. For the purpose of ascertaining whether there has been any mutilation or defacement or any unauthorized entry in any permit, certificate or license, the Secretary may require the production of the permit, certificate of competency or license as the case may be, before him for inspection and on such requisition, the license / certificate / permit holder is liable to produce it.

### 33. MISCONDUCT OF LICENSED CONTRACTORS, SUPERVISORS AND ELECTRICAL WORKMAN

(1) Whenever it appears any licensee or SCC holder or Permit holders—

- (a) Has violated any provisions of these rules
- (b) Has violated any of the terms and conditions of the license or SCC or Permit
- (c) Has played fraud or misrepresented to any authority, organization or to any person with regard to license or SCC or Permit either before or after obtaining the same.
- (d) Has misbehaved with any officers or officials, or has been convicted by a court of law or blacklisted by any Govt. Undertaking in relation to electrical works.
- (e) Has violated any tender condition reported by the officer's of the State Govt. / Central Govt. & its Undertaking.
- (f) Is declared bankrupt or insolvent, by the appropriate authority or wound up dissolved, or portioned.
- (g) Has wrongly represented to any authority with regard to the quality of electrical installation work carried out by him [ if the electrical installation work has not been or is not being carried out in accordance with provision of CEA (Measures relating to safety and Electric Supply) Regulation, 2010].

The Board may suspend license / SCC / permit, as the case may be pending enquiry in to alleged contravention of any of the rules/regulation for a period which may be up to the period of validity of license / SCC / Permit. Such an order may be passed by the Chairman if he is *prima facie* of the view that the licensee / SCC holder / Permit holder is guilty of an offence. The period of such suspension shall be ordinarily not exceeding 6 (six) months.

- (2) Where the license / SCC / Permit is suspended, the licensee / SCC holder / Permit holder shall not carry out any work until the suspension is revoked by a separate order as per the decision of the Board.
- (3) The Chairman may order for an enquiry by the officer of the Electrical Inspectorate not below the rank of Deputy Electrical Inspector and place before the Board the enquiry report. Based on the enquiry report the Board may cancel the license / SCC / Permit for



a minimum period of three years or revoke the suspension. Further, to revoke such suspension of license / SCC / Permit; he shall make a representation to the Board enclosing the order of the Board / Chairman :

Provided that, no license or SCC or Permit shall be cancelled, except after giving the licensee / SCC .holder / Permit holder, an opportunity of making representations.

(4) Where the license / SCC or Permit is cancelled, the licensee / SCC holder / Permit holder shall not be eligible to carry out any work until the cancellation is revoked by a separate order as per the decision of the Govt. or the Board.

(5) Further to revoke such cancelled license or SCC or Permit, he shall make a representation to the Board enclosing the order of the Govt. or the Board. The Board may revoke the cancelled license or SCC or Permit.

#### 34. APPEALS :

(1) Any person aggrieved by the order of the Board, may appeal to the Secretary, Department of Energy, Government of Odisha within a period of thirty days from the date of receipt of the order by him.

(2) The order of the Government shall be final.

35. "Annexure-I" Syllabus for Electrical Workman Permit.

"Annexure-II" Syllabus for Electrical Supervisor .Certificate of Competency (SCC -MV).

"Annexure - III" Syllabus for Electrical Supervisor Certificate of Competency (SCC - HT).

"Annexure - IV" Syllabus for Electrical Supervisor Certificate of Competency (SCC - EHT).

"Annexure - V" For Duplicate License / SCC / Permit.

"Annexure - VI" Return Form for Electrical Contractor.

This notification supercedes earlier notifications issued on Electrical Licensing Board Odisha (ELBO) Regulation in this Department.

[No. 9553—EL-Misc.-28/2013-(Pt.)]

By order of the Governor

S. C. MOHAPATRA

Principal Secretary to Government

## SYLLABUS FOR ELECTRICAL WORKMAN PERMIT

(See Regulation 13)

## (A) For Electrical Wireman (MV)

## (a) Domestic Installation up to 650 Volts—

- (i) General knowledge about A.C & D.C systems (Generation, Transmission & Distribution, both single phase & three phase in case of A.C system)
- (ii) General knowledge about conductors, insulators, semiconductors, resistors, fuse wires, electrical voltage, current, power & energy both in AC & DC systems.
- (iii) Selection and use of proper sizes, grades of solid & stranded conductors use of wire gauge, etc.
- (iv) Use of test lamps, bells, buzzer, continuity tester & battery in the testing requirements of circuits.
- (v) Methods of testing out of polarity, phasing out of circuits.
- (vi) Connections and diagrams for main switches, distribution boards, ceiling roses, plugs, sockets, switches (including 2 way), lamp holders, fans with regulators, MCCB, MCB, RLCB, ELCB, rotary switches and changeover switches, etc.
- (vii) Different types of wiring, fittings & other devices required for domestic wiring.
- (viii) Installation work of the classes and with the kinds of cables & wires for building wirings (for fans, lights, small motors and other appliances for domestic use) , with CTS, conduit, cleat, wood casing and capping and other systems of wiring permitted under Indian standards (BIS) and safety regulation 2010 of Central Electricity Authority.
- (ix) EARTHING OF INSTALLATIONS : importance of earthing, running earth, GI pipe earthing, plate earthing etc.
- (x) Testing for fault, measuring insulation resistance, by insulation tester and continuity tester.
- (xi) JOINTING & SOLDERING : • Making straight & T-joint in solid & stranded conductors and soldering them. • Soldering .plugs & sockets on wires & cables and finishing off & insulating.

## (b) For Industrial Installation up to 650 V—

- (i) Wiring of 3-phase motors, generators with associated control gears with various type of wires and cables.
- (ii) Knowledge of current carrying capacity of different sizes of wires & cables used for industrial wiring. Choice & selection of appropriate size & grade of wires & cables for industrial appliances of various purpose of use.

- (iii) Knowledge of working of motors, generators with associated control gears, familiarity with normal type of faults and diagnoses of fault location.
- (iv) Measuring earth resistance with an earth testing instrument (earth tester)
- (v) Laying & jointing of cables of voltage up to 650 V used in industrial wiring.
- (vi) Practice in terminating an underground cable to a Bus Bar chamber, Crimping Lugs to the conductor of the cable, connection to Bus Bar, loop connection for other circuit, etc.
- (vii) General Knowledge of safety precautions for personnel & equipments, fire fighting, electric shock to a person, first aid and shock treatment.

(B) For Electrical Lineman (MV)—

- (i) Knowledge of 3-phase & single phase voltage system up to 650 V for connection of voltmeters, ammeters, energy meters, etc.
- (ii) Knowledge about power & energy with simple calculations.
- (iii) Reading of energy meters, simple methods for ascertaining the correctness of meter readings by use of lamps for fixed time.
- (iv) Use of clamp on tester (ammeter), voltmeter, insulation tester and earth resistance tester.
- (v) Giving service connection in single & 3-phases and attending to the consumers' complaints.
- (vi) Construction, maintenance and operation of overhead and underground lines & installations including equipments up to 650 V.
- (vii) Maintenance of different switch gears, substation equipment, filtering of transformer oil, connection and maintenance of different types of street lights.
- (viii) Knowledge about operation of air-conditioning, ventilation system & lift.
- (ix) Station Batteries, battery charging equipment.
- (x) Knowledge about the use of stabilizers, inverters, etc.
- (xi) Knowledge about the standard conventional symbols used for electrical equipments, systems, the drawings thereon and toolkit.
- (xii) Industrial switch boards, distribution system, etc.
- (xiii) Acquaintance with safety regulation 2010 of CEA for overhead and underground lines up to 650 volt.

ENDORSEMENT FOR CABLE JOINTING - Workman possessing Wireman - MV & Lineman - MV permits will have endorsement for jointing up to 650 volts if during practical test they are found to have acquired adequate knowledge and experience in cable jointing work for cables of different types and installations.

## (C) For Electrical Workman (HT)—

(Overhead and underground installations and equipments up to 33 KV)

The syllabus prescribed for Lineman (MV) is common to the syllabus of Workman (HT) with the following syllabus—

- (i) General knowledge about the HV systems (Generation, Transmission & Distribution).
- (ii) Construction, Maintenance & Operation of overhead lines installation, substations and equipments up to 33 KV.
- (iii) Knowledge about the line & substation, construction standards, i.e. RECs., IS standards for HV systems.
- (iv) Principle and working of alternating current, direct current, generators and their parallel operations.
- (v) Principle & working of Transformers and their parallel operation.
- (vi) Principle & working of Alternating Current & Direct Current motors and their speed characteristics, controls, etc.
- (vii) General use of protective switchgears, i.e. relays, CTs, PTs, Lightning arresters, etc.
- (viii) Simple estimation of requirements of the materials.
- (ix) Measurement of power, power factor and improvement of power factor in both single phase and 3-phase system.
- (x) Earthing of HV systems.
- (xi) Different Circuit Breakers used in HV systems.

ENDORSEMENT FOR CABLE JOINTING - Workman possessing Workman HT permits will have endorsement for jointing up to 33 KV, if during practical test they are found to have acquired adequate knowledge and experience in cable jointing work for cables of different types and installations.

## Additional Syllabus for Mining Workman—

Workman of MV & HT category will have endorsement for working in the mines.

WIRING: - Wiring layouts of different types such as cleats, lead covered, cable type sheathed for lighting purposes at the surface and armoured cables for power and lighting installation underground.

CIRCUIT KNOWLEDGE: - Electrical connections for DC & AC generators, DC & AC Motors, their starters and regulators, Switch Board & Transformer, etc. Distribution boards with circuit breakers, switch fuse units and gate switches, Battery charger and lamp cabin.

APPARATUS INCLUDING FLAME PROOF APPARATUS SUITABLE FOR USE IN HAZARDOUS LOCATIONS IN COAL AND OIL MINES:

INSTALLATION AND MAINTENANCE OF— Electrical winders including automatic contrivances, haulages, ventilating fans, pump units and compressors, their controls gears and starters. • Rectifier, rotary converters, electric locomotives and battery charging station. • Portable and transportable apparatus. • Power and lighting transformers and capacitors. • Safe signaling equipment including telephone equipment. • Shot firing apparatus including cables, their uses routine tests and maintenance.

Elementary calculation knowledge about power, load, energy consumption in pumping, hauling and other machineries, etc.

TESTING AND FAULT ATTENDANCE - Detection and location of earth other faults in electrical apparatus and cables, low voltage and remote control circuits. Insulation and continuity tests, rectification of faults, tests for insulation resistance to earth, testing of leakage protective device, Earth testing and its continuity.

FLEXIBLE TRAILING CABLES FOR PORTABLE AND TRANSPORTABLE APPARATUS— Knowledge of different types of flexible cables including pliable armoured cables, their installation, maintenance fault detection, efficient repairs by vulcanized joints and testing.

SAFETY AND PROTECTIVE DEVICES - Knowledge of earth of metal frames of machineries. Use of H.R.C. cartridge, fuse in circuit breaker as back up protection. Overload, no-volt and earth leakage protection of circuit breakers and starters.

FIRE PRECAUTIONS - Fire extinguishing appliances & their use in mines & oil fields.

SAFETY RULES - working knowledge of the Safety Regulation, 2010 of CEA with particular reference to chapter for Mining and Oil field. Safe & minimum clearance above the ground of lowest conductor of overhead lines or overhead cables.

#### (D) For Electrical Workman (E.H.T)

The syllabus prescribed for Workman (HT) is common to the syllabus of Workman EHT with the following syllabus :—

1. General knowledge about power Generation, Transmission and Distribution system in India.
2. Advantage of High Voltage & Extra Voltage Systems.
3. High Voltage & E.H. Voltage A.C. & D.C System.
4. Knowledge in Extra High Voltage transmission system.
5. Types of Tower, shapes & geometry—
  - (a) Self-supporting towers, conventional guyed towers, Chainette Guyed Towers;
  - (b) Tower designation— Suspension Tower, Tension Tower, Transposition Towers, Special Towers.
  - (c) Tower Height, Width, Tower anatomy, foundation.

6. Safe electrical clearance of E.H.V. Lines, Spacing between conductors.
7. Simple knowledge about Tower members, member selection & redundant members, Bolts & nuts, etc.
8. Testing of towers Testing requirement's.
9. Conductors used in EHV, Earth wire, Earth insulator, stringing span, jumper, Hot line stringing of EHV lines.
10. Tools used in EHV lines: Theodolite, Dumpy level, Gin pole / Deric pole, polypropylene rope, single shane pulley, Hydraulic compressor, Earth Tester, winch, etc.
11. EHV underground cable, cable laying, permissible bending of cables, Depth of layings. Maintenance, Inspection of Cables, Cable Joints, Cable Termination, Crimp Connections, Fault locating in U/G cables, Methods of fault location, Pre-locating the fault distance, pinpointing of cable fault. .
12. SUB-STATION -
  - (i) Standard layout of Sub-station, bay size, equipment position.
  - (ii) Types of bus bar materials, clearance of equipments and rigid conductors spacing for phase strung bus/standard bus, equipment elevation.
  - (iii) Earthing practice, earth mat.
  - (iv) Earth measurement 3 point & 4 point method.
  - (v) Surge / lightning arrester.
  - (vi) Transformer, Isolators, Breakers, Earth switch, CT, PT, CVT, Post Insulators, wave trap, capacitor bank, etc.
  - (vii) Transformer's testing & maintenance of transformers.
 

Checks: Silica gel, oil test, Insulation test, PI value check, oil & winding temperature calibration, BDV test, gas analyzing, Bucholz relay, oil level check, Tap changer, moisture content test, cooling fan operation, ratio check. Bushing CT Check, oil filtration, etc.
  - (viii) Maintenance schedule of breakers, transformers, CT,PT,CVT,PIs, lightning arrester, earth pit.
  - (ix) Duties of operation persons in Sub-station—
    - (i) Line Permit.
    - (ii) Isolation & restoration of system to work on permit.
  - (x) Station batteries, maintenance batteries, battery charger.
  - (xi) Protective relays used for EHV systems Energy Meters, Ammeter, Voltmeter, Power Factor Meters, Metering.
  - (xii) Control equipments.

SYLLABUS FOR ELECTRICAL SUPERVISOR CERTIFICATE OF  
COMPETENCY (SCC - MV)

Electrical Engineering Paper (Written Test)  
Part - I & Part - II for General Category of S.C.C. Examination  
Part - I & Part - III for Mining Category of S.C.C. Examination

PART - I

(Common Syllabus for General & Mining category)

Electricity Theory (Elementary Knowledge)

Principles of Electricity - Electric voltage, Current and resistance, Ohm's law — Specific resistance, Laws of resistance and their application for calculating . voltage drop, series and parallel circuits. Practical units of voltage, current, resistance, power and energy. Relation between electrical power unit (KW) and Mechanical Power Units (HP).

Electro Magnetism. - Concept of Electro Magnetic Force (EMF), production of E.M.F., Flemings Right and Left Hand Rules, Magnetic, Chemical and heating effects of electric current. Magnetic properties of material. Electromagnets and their various applications.

Materials - Conductors, Semiconductors and insulator materials and their. relative merits. Transformer oil, Effect of heat and moisture on insulation. Lubricants and their uses.

Different types of wires, cables, switches, circuit breakers, cutouts, etc.

Generation of Electricity - Sources of natural energy. Renewable and Non-renewable source methods of production of electricity both Alternating Current and Direct Current.

A.C. Generators (Alternators) - Essential components and constructional feature. Methods of voltage and frequency control conditions and methods for synchronizing, simple associated switch board and its accessories.

D.C. Generators - Essential components and constructional features, Shunt, series and compound dynamos and their characteristics, causes for sparking. Interpoles, Commutators and their maintenance. Carbon brushes, their adjustment and care. Methods of voltage regulation. Conditions for parallel operation, simple associated switch board and its accessories.

Batteries - Primary cells, Dry cells, storage or secondary batteries or accumulators and their installations. Lead acid cells, Nickel, Iron or Alkaline cells. Initial and subsequent charging of batteries. Charging circuits and their calculations. Series and parallel circuits. Maintenance of batteries. Use of Hydrometers.

A.C. Motors - Theory of induction (squirrelcage and slip-ring type) synchronous and commutator motors, their uses, installation, method of starting, speed control and reversal of direction.

D.C. Motors - Theory of series, shunt and compound wound type motors, their uses, installation, method of starting, speed control and reversal of direction.

A.C. Circuits - Knowledge of vectors. Phase and phase difference. Resistance, inductance and capacitance in an A.C. Circuit. Periodicity or frequency. Power and power factor. Single phase and three phase systems. Star and delta connections. Phase sequence.

Controlling and Regulating Gear - Knowledge of various types of switches, circuit breakers, cutouts, starters, regulators and protective devices for both A.C. and D.C. motors and their wiring with the motors.

Transformation - Knowledge of single phase and three phase transformers, their construction, use and maintenance. Phasing out, parallel working, auto transformer, transformer tapplings, temperature rise, instrument transformer.

Conversions - Principle of operation of motor generator sets, rotary convertors and mercury arc rectifiers.

Transmission and Distribution :

Overhead Lines - Simple calculations and general principles of construction of low, medium and high voltage lines. Size of conductors, length of spans, sag, strength of poles, spacing of conductor, cross arms, effect of temperature, wind pressure, ice and snow, tension on wire. Insulators, brackets, stays, struts, guard wires and other protective devices. Earthing, lightning arresters, lightning conductors and their testing and fault location.

Underground Cables - Underground cables, simple calculations and general principles of laying cables direct in ground, intrenches and pipes. Handling, bending, jointing, plumbing. Underground and above ground junction boxes. Distribution board and pillars. Joint box compound, melting of compound and filling boxes with compound. Testing and fault location.

Illumination - Metal filament lamps, fluorescent lamp circuits, high voltage luminous tube sign installations. Photometric units and simple measurements. General requirements of efficient lighting and elementary calculations. Street lighting. Time switches.



### Generation :

(a) DC and AC power supply for auxiliaries, arrangement of unit auxiliary and station service boards, station lighting and automatic changeover. Station .batteries and charging methods. Standby and emergency power and lighting systems.

(b) Testing & Measurement - Working principle and basis of instrument and measurements. Details of measuring instruments for pressure, flow, temperature, level, vibration, alignment and current, voltage, power, reactive power, frequency, energy, winding temperature, auto controllers, recorder, insulation, tester, its use for primary detection of faults, data acquisition system, digital distributed control, UPS etc. Testing of electrical & mechanical testing equipments.

(c) Control & Protection - Sequential operation & interlocks, general machine start/stop, sequence of operation.

### SAFETY RULES— Working Knowledge of—

(a) Safety regulation, 2010 of CEA (Measures relating to safety and electric supply)

(b) Fire safety procedures, fire protection of generators, transformer and fire fighting and emulsifier type protection, regarding Factory Act. Electricity Act, 2003.

Protection and restoration of persons suffering from electric shock.

## PART - II

### Syllabus for General Category of SCC (MV)

#### Electricity Utilization for—

##### **Domestic installation :**

- ❖ WIRING - Wiring layout of different types such as cleat, metal sheathed, wood casing and capping, cable type sheathed, conduit and armoured cable for lighting and power installations in residential premises together with the necessary switchgear, estimate of materials and cost of different types of installations. Wiring of temporary installations and portable appliances.
- ❖ CIRCUIT DIAGRAM - Electrical connections of various circuits for (i) House wiring including those for main and sub-distribution boards, switches and cutouts, etc. together with the load statement for each circuit, (ii) Lifts with their safety devices.
- ❖ APPARATUS - Installations and maintenance of heaters, cookers, refrigerators and other domestic appliances. Electric bells and indicators. Small motors for pumps and electric lifts.
- ❖ ENERGY MEASUREMENT AND CHARGES - Energy meters both D.C. and A.C. for house service.

- ❖ SIMPLE CALCULATION - Simple calculations relating to cost of energy, elementary knowledge of methods of charging for energy.
- ❖ TESTING AND FAULT ATTENDANCE - Detection and location of faults in domestic appliances and wiring installations. Insulation and continuity test. Rectification of faults. Tests for insulation resistance to earth. Earth testing.
- ❖ PROTECTIVE DEVICES - Elementary knowledge of the use of fuses and cutouts, earthing of domestic appliances, motors, etc. use of lighting arrestors.

#### **Industrial installation —**

- ❖ WIRING - Wiring layouts of different types such as cleat, wood casing and capping, metal sheathed, cab type sheathed, conduit and armoured cables for lighting and power installations in industrial premises together; with the necessary switchgear. Estimates of materials and cost of different type of installations. Wiring of temporary installations and portable appliances.
- ❖ CIRCUIT DIAGRAMS - Electrical connections for D.C. & A.C. Motors, their starters regulators, Main and sub-distributing boards with circuit breakers, switches, fuse units with load statement for each circuit, D.C. & A.C. Motors, their, starters regulators, Battery charging equipments, Converting machinery Lifts with their safety devices.
- ❖ PUMP INSTALLATIONS - General principles and elementary calculations of head, power and energy requirements.
- ❖ APPARATUS - Installation and maintenance of generators, electric motors, electric lifts, electric furnaces, electric welding plants, haulage and winding machines, cooling and heating appliances.
- ❖ POWER AND ENERGY MEASUREMENT AND CHARGES - Measurement of power, Wattmeters, energy meters both D.C. & A.C., power factor correction by capacitors.
- ❖ SIMPLE CALCULATION - Simple calculations relating to cost of power and energy, elementary knowledge of methods of charging for demand and energy.
- ❖ TESTING AND FAULT ATTENDANCE - Detection and location of faults in D.C. & A.C. generators, motors, overhead distribution lines and underground cables, electric instruments and apparatus and wiring installations. Rectification of faults, Insulations and continuity tests. Tests for insulations resistance to each earth testing.
- ❖ PROTECTIVE DEVICES - Elementary knowledge of earthing of generators, motors, machines, installations and appliances. Use of lighting arresters, fuses including high rupturing capacity fuses, cutouts, circuit breakers, over load and no volt protections, thermal trips, filed breaking switches and over speed protection.

## Syllabus for Mining Category of SCC(MV)

**Mines installations—**

- ❖ WIRINGS - Wiring layouts of different types such as cleats, lead covered, cab type sheathed for lighting purposes and armoured cables for power installations, different types of trailing cables and their use.
- ❖ CIRCUIT DIAGRAMS - Electrical connections for D.C. &-A.C. generators, switch boards, transformers, etc. Distribution boards with circuit breakers, switches, fuse units and gate-end switches. D.C. & A.C. motors, their starters and regulators.
- ❖ APPARATUS - Installation and maintenance of Electrical Winders, haulages and pump units, their control gears and starters. Rectifiers rotary converters and electric locomotives. Portable and transportable machineries, coal cutting machines, loaders, conveyors, gate-end switches. Drill panels with drill units and their control systems. General principles and elementary calculations of load, power and energy consumption in pumping, hauling and winding installations and other working face machineries.
- ❖ POWER AND ENERGY MEASUREMENT AND CHARGES - Measurement of power, Wattmeters, energy meters both. D.C. & A.C. power factor correction by capacitors. Simple calculations relating to cost of power and energy. Elementary knowledge of methods of charging for demand and energy.
- ❖ TESTING AND FAULT ATTENDANCE - Detection and location of earth or other faults in electrical apparatus and cables. Insulation and continuity test. Rectification of faults. Test for insulation resistance to earth. Testing of leakage, protective devices. Earth testing
- ❖ PROTECTIVE DEVICES— Elementary knowledge of earthing of metal frames of machineries. Use of fuses. Over-load, no volt and earth leakage protection of circuit breakers.

SAFETY RULES - Working knowledge of—The CEA Safety Regulation, 2010, i.e. (Measures relating safety and Electric supply) for mining installation.

SYLLABUS FOR ELECTRICAL SUPERVISOR CERTIFICATE OF  
COMPETENCY (SCC - HT)

PART - I

(FOR GENERAL CATEGORY)

1. Subject covered under the syllabus for Supervisor (MV) and the following:—

**2. HT Overhead Lines - 11 KV & up to 33 KV :**

- Survey, Design, Construction standards, Foundation, Erection, Stringing and Construction equipments.
- Testing, Fault locations, commissioning, Maintenance and Protections including safety devices and testing equipments.
- Selection of supports, cross arms brackets, stays, struts, insulators and associated hardware.
- Types and size of conductors— Length of spans, sag, spacing of conductors, effect of temperature wind pressure, ice and snow on tension of conductors, lighting on conductors.
- Knowledge about construction standards of REC & CBIP for lines sub-station and other equipments utilized in this HT system.
- General requirements of earthing, lighting arresters, guard wires, relays and other protective devices. Each type of earthing, size of earth conductor, pole earthing, lighting arrester earthing, etc.

**3. HT Cables - 11 KV & 33 KV and Control Cables :**

- Criteria for selection of power cables, types of cables, continuous current ratings of underground cables, short time loading of power cables, rating factors for intermittent loading, power factor of cables.
- Guidelines for cable laying, . recommendation and checklist for supervising cable laying work, termination, jointing, plumbing of cables, crimp connection.
- Underground and surface junction boxes. Fault locating in underground cables, power cable sheath fault. Equipments used & methodology for locating fault in pilot cable, etc.

**4. HT Sub-stations and Control Room :**

- Layout, Design, Construction standards of HT Transformers and associated equipments (i.e. CBs, Insulators, LAs, Capacitors, CTs, PTs. etc.). Gas insulated switchgear & sub-station. Sub-station earthing, Earth Mat, Tower ground up.
- Power and distribution transformers, their erection, commissioning, fault locations and maintenance.

- Protective relays and measuring equipments and their networking.
- Testing, Commissioning, fault locations, maintenance and protection of HT cables and testing equipments.
- Design and installation of capacitor banks and their maintenance.
- Erection, Testing, Commissioning and Maintenance of Control Room equipments including station batteries and communication system.

**5. HT Motors and Generators (DC and AC) :**

- Installation, Testing, Commissioning, protection and Control and Maintenance of HT Industrial Motors.
  - Working of generating plants and power stations (Hydro Thermal, Nuclear, etc.) including auxiliaries and their maintenance.
  - Insulating materials, operating temperatures.
6. Working of Alternators, converters and rectifiers and their applications.
  7. Electrical Traction and selection of motors for Electrical locomotives.
  8. Use and maintenance of High Voltage apparatus like X-ray machines, welding machines, neon signs, etc.
  9. Operational knowledge on measuring instruments, i.e. Oscilloscopes Ammeters, Voltmeters, Multimeters, VTVM, Tongue Testers, Meggers, HV testing Kits, etc.
  10. Generation, Transmission and Distribution of the State, Inter-State and the Central Net Work.
  11. Illumination, Fire fighting and Earthing systems including their maintenance.
  12. Tariffs including HT Tariffs, method of charging for demand and energy, power factor and billing.
  13. Basics on operation and data analysis of computer, as relevant to the operation and maintenance in electrical networks.
  14. Preparation, representation, interpretation of electrical drawings and execution of electrical works.
  15. Specifications, evaluation, analysis of electrical schemes, tendering, purchase orders, procurements, stores, inventory, etc.
  16. Conversant with Electricity Act, 2003, CEA safety regulation and the distribution code of OERC.

## ( FOR MINING CATEGORY)

1. Syllabus covered for Supervisor Certificate of Competency (MV) Examination with the following :—

**2. HT Overhead Lines -11 KV and up to 33 KV :**

- Survey, Design, Construction Standards, Foundation Erection, Stringing and Construction equipments.
- Testing, fault locations, commissioning, maintenance and protections including safety devices and testing equipments.
- Selection of supports, cross arms, brackets, stays struts insulators and associated hardwares.
- Types, and size of conductors, length of spans, sag, spacing of conductors, effect of temperature, wind pressure, ice and snow on tension of conductors, lighting on conductor.
- Earthings, lightning arresters, guard wires, relays and other proactive devices.

**3. HT Cables -11 KV and 33 KV and Control Cables :**

- Classification of cables, criteria for the selection of power cables, PVC & XLPE underground cables. Classification of tests for cables laying, safe handling of cable drums, cable joints, cable terminations, crimp connections, maintenance of electric cable, flexible cable, flexible cables for portable machines', faults in underground cables system, methods of fault location underground cable system.

**4. HT Sub-Stations and Control Room :**

- Layout, design, construction standards of HT transformers and associated equipments (i.e., CBs, Isolators, Las, Capacitors, CTs, PTs, etc.)
- Power and distribution transformers — their erection, commissioning, fault locations, and maintenance.
- Protective relays and measuring equipments and their networking, Transformer protection, Generator, Diesel Generator protection.
- Testing commissioning, fault locations, maintenance and protection of HT cables and testing equipments.
- Design and installation of capacitor banks and their maintenance.
- Erection, testing, commissioning and maintenance of control room equipments including station batteries and communication system.

## 5. HT Motors and Generators (DC and AC) :

- Installation, testing, commissioning, protection and control and maintenance of HT industrial motors.
  - Working of Generating plants and power stations (Hydro, Thermal Nuclear, etc.) including auxiliaries and their maintenance.
6. Working of Alternators, converters and rectifiers and their applications.
  7. Operational knowledge on measuring instruments, i.e Oscilloscopes, Ammeters, Voltmeters, Multimeters, VTVM, Tongue Testers, Meggers, HV testing kits, etc.
  8. Illumination, fire fighting and earthing systems including maintenance.
  9. Preparation, representation, interpretation .of electrical drawings and execution of electrical works.
  10. Flame proof equipment / intensicallly safe for underground switch board, panels, breakers, etc. for underground.
  11. Basics on operation and date analysis of computer as relevant to the operation and maintenance in electrical networks.
  12. Conversant with Electricity Act, 2003, Safety Regulation, 2010 of CEA. particularly to the relevant statutory requirements for mines. Knowledge about relevant Indian Standard for electrical equipments & installations of mines.

## ANNEXURE-IV

### SYLLABUS FOR ELECTRICAL SUPERVISOR CERTIFICATE OF COMPETENCY (SCC - EHT)

#### (A) SUB-STATION

1. Layout & Location of Sub-Station, i.e. 400/220/132/33 KV.
2. Main equipments & specification of equipments.
3. TRANSFORMER — Basic principles of transformers'& working principles of its accessories like coolers, on load/off load Tap changer, breathers, conservator, bushing of different types, Buchholz Relay, Indicators & Alarms. Transformer routine & type tests, maintenance and repair, .failure and its causes. Transformer oil, testing, filtration and its values to ascertain its condition. Parallel operation of transformers, regulation & voltage control by tap-changing, commissioning tests, routine maintenance.
4. BREAKERS - Function of 'different types of breakers, i.e. indoor, outdoor, MOCB, SF<sub>6</sub> etc. Normal current rating, rupturing capacity. Commissioning procedure, operation & maintenance, failure and its causes.

BUS BAR:- Indoor & Outdoor capacity forces on them during short circuit, mounting & bus bar mounting and clearances. Outdoor Strung / Tubular type supports bus bars, their current rating, jumpers &, clearances. Bus bar fitting / connectors.

5. CURRENT AND POTENTIAL TRANSFORMERS — Types, Working principle, Rating and Accuracy class and testing.
6. ISOLATORS - Types (Tilting, rotating, horizontal, vertical tandem, etc.) with and without arching horns, current rating, breaking of circuits, interlock with circuit breaker, maintenance of Isolators.
7. LIGHTING ARRESTOR—Types, Principle of working, rating, earthing, location and testing of lighting arresters & its maintenance. PDCC, Carrier Communication, PLCC and protection through PLCC and Carrier inter tripping.
8. REACTOR - Types, Principle of working, rating, installation and commissioning, repair and maintenance.
9. CAPACITOR BANK -Types, Principle of working, rating, installation, commissioning, repair & maintenance.
10. PROTECTIVE RELAYS - Types of relays, principle of working, rating, installation and commissioning, repair and maintenance. The basic principle of protection of equipments/ lines, i.e. Local & back up protection, Transformer Protection, Line Protection & New generation Relays, their testing and maintenance.
11. CONTROL ROOM— Necessity and function of control boards & panels, types of control panels, instruments on control boards and panels. Mimic diagram, indicators, semaphore annunciation system including alarm & bell testing of relays and setting principle. Remote control of breakers, isolators, tap changers, indicators in control boards and panels. Control cables & power cables.
12. AUXILIARY SUPPLY & BATTERY— Battery ratings,/capacitors, charging and discharging and trickle charger. Rectifiers. Importance of DC supply & its function, Auxiliary DC supply maintenance of Battery system.
13. EARTHING— System Earthing, Safety earthing, method of earthing, solid, resistance, impedance, Peterson coil earthing, earthing of lighting arresters, importance & advantages of each type. Different types of earth electrodes, earth mats, recommended values of earth resistance and its measurement. Design of earth mats. Knowledge about step & touch potential.
14. GAS INSULATED SWITCHGEAR—Construction of GIS, Metal enclosures, insulators, conductors and connectors, circuit breaker, CT..PT, surge arresters, bay connections indoor & outdoor installations under GIS category.



## (B) LINES—

1. Detailed survey and alignment of lines.
2. Types of Tower, Template & Tower spotting, stub setting, concreting, back filling.
3. Erection of towers, tightening, punching of bolts, electrical clearances.
4. Type of Insulators, Electrical/Mechanical characteristics, hardwares and fittings.
5. Type of conductors, current carrying capacities, earth wires and sizes.
6. Stringing equipments & use, Tension & Sagging of conductors, stringing procedure, statutory phase to phase & earth clearances, jumpering, use stringing chant.
7. Earthing of Towers, types of Tower earthing.
8. Testing conductor continuity, Insulators resistance.
9. Charging / discharging of EHV Lines', Live Line testing.
10. Safety procedure, procedure for line clearance.
11. Identification marks, phase plates, circuit plates, anti climbing devices, step bolts, bird guards, number plates, danger plates, anti-vibration dampers.
12. Maintenance, tests and measurements, use of construction/maintenance tools & equipments, Theodolite, Dumpy level, measuring tapes, conductor jointing tools, bolted come-alongs, winches, Aerial trolleys, Aerial rollers, Thermometers, Dynamometers, Lineman's .rarchat, pull-lift devices, wire ropes, spanners, twin backles, etc. & testing equipments.
13. Tower foundation, investigation of foundations of Towers, repairs of foundation of a Tower line in service, foundation defects & repairs.
14. Manpower, Tools and plants.
15. Hot line stringing of HV lines.

(C) CABLES— HV& EHV category cables, criteria for the selection of cables, short time loading of power cables. EHV tests on cables, guidelines for cable laying, cable joints, cable terminations, crimp connections, fault locating in underground cables, sheath fault, sheath fault locating equipment and methodology.

(D) HVDC— DC transmission, HVDC structures, bus bars, clearances, earthing system, circuit breaker, tests on HVDC CB, instrument transformers, standard layout in, sub-station, different protective devices.

(E) FIRE PROTECTION & FIRE FIGHTING— Classification of fire, various types of fire extinguisher, fire protection for power transformer, multifyre system of protection, CO<sub>2</sub> installation, Fire hydrant system, General safety precautions and practices in operation & maintenance.

(F) CLEARANCE & COMPLIANCE OF CEA SAFETY REGULATION—Minimum clearance between phases and phase to ground and sectional clearance of equipments at different voltages level. Provision of CEA Safety Regulation relating to sub-stations and lines.

**AFFIDAVIT**

(FOR DUPLICATE LICENSE / SCC / PERMIT)

(To be executed on Stamp Paper as per the Odisha Stamp Duty Act)

I, ..... S/o..... residing  
at ..... has lost / torn my License / SCC / Permit at .....:  
solemnly affirm and state on oath as follows :

That my License / SCC / Permit No..... valid up to ..... is  
lost on ..... for which I have lodged a police complaint vide  
No..... dtd ..... at that in the event of finding the lost License /  
SCC / Permit, I undertake to surrender the same to the Electrical Licensing Board,  
Odisha (ELBO), Bhubaneswar.

What I am stated above is true and correct to best of my knowledge and  
information and belief.

Photo with  
signature of  
the applicant  
to be attested  
by the Notary

SIGNATURE OF THE APPLICANT

SWORN TO BEFORE ME

ATTESTED BY NOTRAY

**RETURN FORM FOR ELECTRICAL CONTRACTORS**

Return for (Tick the appropriate box) for the year.....

1st Quarter i. e., April-June	2nd Quarter i. e., July-Sept.	3rd Quarter i. e., Oct.-Dec.	4th Quarter i. e., Jan.-March.

Name &amp; Address of the Contractor .....

Name of the owner of the installation	Name of work and Type of installation	Cost of the work (in Rs.)	Name of the Supervisor & SCC No.	Name of the Workman with permit/Workman Helper engaged for each installation	Permit No.	Period on which the Workman and Helper were engaged	Period on which the Supervisor was present for supervision and (date of final check)	REMARKS
1	2	3	4	5	6	7	8	9

Full Signature of the Supervisor

S. C. C. No.

Full Signature of the Contractor  
Electrical Contractor License No.